

**PROFESSIONAL SERVICES
REQUEST FOR PROPOSALS****North System Renewal Water Treatment Plant (NSRWTP)
Design Package #2 (DP#2) – Treatment Process Systems and Structures****Section 1. Background and History**

Denver Water (DW) is in the process of replacing the aging Moffat Treatment Plant with a new, modern plant located near Ralston Reservoir. The site is owned by DW and has approximately 80 acres available for the NSRWTP. The new facility will have the capacity to initially treat from 10 to 150 million gallons per day (MGD) and be expandable to treat up to 250 MGD, with accommodations for future unit processes such as ozonation, ultraviolet (UV) disinfection, and granular activated carbon (GAC) adsorption. Facility accommodations will also maintain available land for a parallel treatment system should a more impaired water source be treated at this site in the future.

In 2015, DW completed initial pilot testing for this source water that is usually consistent in quality with a low turbidity and total organic carbon content. The results of the pilot test indicate that with proper chemical feed rates and pre-treatment design, the filtration rates can exceed 10 gallons per minute per square foot (gpm/ft²). Other process decisions have not been finalized and will be part of the scope of work for the DP#2 Consultant to complete during preliminary design.

Section 2. Project Description

DW is soliciting proposals for a **DP#2 - Treatment Process Systems and Structures** design consultant (Consultant) to execute and deliver the primary water treatment processes, equipment and associated support structure preliminary design phase services for the NSRWTP. The NSRWTP is a new 150-MGD facility located on DW property near Ralston Reservoir north of Golden on Colorado State Highway 93.

The project execution will be a joint effort between DW, DW's Owner Representative (OR), a Construction Manager-at-Risk (CMAR), and the design team. The design team will be comprised of a multi-disciplinary team based on the design packages (DPs) for the NSRWTP.

- DP#1 – Site and Civil Improvements
- DP#2 – Treatment Process Systems and Structures
- DP#3 – Electrical, Instrumentation & Control Systems
- DP#4 – Ancillary Treatment Process Systems and Structures
- DP#5 – Architectural and Building Systems
- DP#6 – Post-Tensioned Water Storage Tanks

DW/OR's responsibilities will include project management, internal and external communications, scheduling of internal resources, design management, review, and budget allocation. The Consultant's responsibilities and pertinent project information are presented herein with instructions for preparing a complete proposal to serve as the Treatment Process Systems and Structures Consultant for the delivery of the NSRWTP.

The Project will be completed using a step-wise phasing strategy to make decisions and obtain approvals before proceeding to subsequent phases. DW is open to input on how to accomplish this phased implementation with the understanding that DW may choose to accelerate or slow down phases in order to satisfy operational or budgetary constraints. DW reserves the right to terminate or amend a DP contract following completion of 20% design, or at any time through construction completion.

Section 3. Project Objectives

The following specific project objectives have been identified:

- Sustainability: The NSRWTP site and facility will be designed to achieve the highest level of sustainability ratings possible in a cost-effective and feasible manner.
- Modularity: The NSRWTP processes will be designed for parallel operation to allow for units to be removed from service (operational and electrical) while the plant remains functional.
- Ease of Access and Maintenance: The NSRWTP site will be designed to allow for safe, efficient flow of traffic; future upgrade, expansion and improvement to processes and structures; and ease of maintenance of all equipment.
- Safety: The NSRWTP will be designed to facilitate personnel safety during construction, startup and commissioning, and long-term plant operations and maintenance.
- Personnel: The NSRWTP will be designed to accommodate existing and future Source of Supply (SOS) facilities, allowing for streamlined operation and control.
- Schedule: The NSRWTP will be operational no later than 2023.
- Budget: The NSRWTP team will accomplish the project objectives within the projected budget.

Section 4. Consultant Scope of Services

The DP#2 Consultant shall be responsible for the 0-20% design and concept alternatives development of the following:

- Design the treatment process mechanical and structural elements for the headworks, coagulation, flocculation, clarification, filtration and disinfection unit processes for a 150-MGD, expandable to 250-MGD, surface water treatment plant (WTP).
- The Consultant shall apply for and obtain all permits required for work associated with DP#2. All local, state, and federal required permits obtained shall be coordinated with the OR for permit tracking.
- The design shall include sizing of the unit processes and equipment to comply with Colorado Department of Public Health and Environment (CDPHE) requirements for surface WTPs and the water quality/treatment goals established by DW.
- The design shall include an analysis of the hydraulics to allow the plant to operate continuously at a range of flows from 10 to 150 MGD, be expandable to 250 MGD, and accommodate the potential future addition of ozonation and/or UV disinfection and GAC adsorption.
- The hydraulic analysis shall also verify the NSRWTP can operate reliably (without excessive solids deposition or maldistribution) at flows as low as 10 MGD, and that treatment trains can be completely isolated to allow extended maintenance activities without the need to install temporary bulkheads.

- The DP#2 Consultant shall provide design information associated with electrical, instrumentation, architectural, civil, plumbing and heating, ventilating, and air conditioning (HVAC) requirements to the DP#1 and DPs#3-6 design consultants for these disciplines selected by DW to produce a comprehensive set of construction plans and specifications.
- Develop a NSRWTP project specific Treatment Process Design Guidance Document (DGD) to establish design standards for the final design. DW intends to use a five-day Lean process with the Consultant to help develop and workshop the DGD.
- Consultant will assist in preparation of site information, drawings, and analysis in preparation for a Lean 2P event with DW and the balance of the design team to determine the final site layout of the NSRWTP. Consultant will identify a lean coordinator and will help in the preparation, participation and follow-up of the Lean 2P event.
- Consultant will identify a Lead Specifications Coordinator to be a part of the NSRWTP Specifications Team (led by DW and the OR) to oversee the development of project specific specifications for DP#2 in conjunction with the development of a NSRWTP project specific Capital Project Construction Standards manual and supplementary technical specifications.
- Consultant will identify an AutoCAD Lead Coordinator to be a part of the NSRWTP Standards Team, and to be responsible for the versioning and control of AutoCAD files and security/permission access to common AutoCAD reference files used by all DPs.
- Consultant will identify a Startup and Commissioning Coordinator to be a part of the NSRWTP Startup Planning Team (led by DP#3) to initiate early planning activities for startup, testing and commissioning the new WTP.
- Consultant will perform Quality Control reviews of DP#4 deliverables (including memoranda, drawings, specifications, calculations, etc.) throughout Phases 2 and 3, and shall provide all DP#2 deliverables to the DP#4 consultant for Quality Control reviews, allowing sufficient review time in the schedule for cross-package reviews.

Section 5. Consultant Qualifications

The Consultant shall demonstrate that the firm and proposed team have the necessary experience to design the NSRWTP to meet DW's Project Objectives and all regulatory requirements. At a minimum, the Consultant shall meet the following minimum criteria:

- The Consultant shall have served as prime consultant for the design of a minimum of three (3) complete Water or Wastewater Treatment Plants (W/WWTP) with a capacity greater than 75 MGD within the last 10 years, with one (1) of the W/WWTPs having a minimum capacity of 100 MGD. The experience may include greenfield plants or expansion of existing facilities with new treatment trains meeting the minimum capacity criteria. Rerating of processes to achieve an increase of 75-MGD capacity does not qualify.
- The Consultant shall have experience designing high-rate granular media filters (greater than 8 gpm/ft²).
- The Consultant shall have experience designing UV disinfection, Ozone and Granular Activated Carbon (GAC) unit processes with a minimum capacity of 75 MGD as part of new WTPs or upgrades at existing WTPs within the last 10 years. Qualifying experience for each unit process may be at different treatment plants.
- Consultant shall have a comprehensive health and safety program to minimize work related injuries.

- Consultant shall have a robust quality assurance/quality control program to verify deliverables have been reviewed and checked. Consultant shall be familiar with DW Capital Projects Construction Standards (CPCS), Capital Projects Procedures Manual (CPPM), and Engineering Standards.
- The Consultant's Project Manager shall have experience managing the design of two (2) multi-discipline W/WWTP projects, each with a minimum construction cost of \$50 million within the last 10 years.
- The Consultant's Lead Process Engineer shall have been in responsible charge for the design of three (3) W/WWTP projects with a minimum capacity of 25 MGD within the last 10 years, with at least one of the W/WWTP projects having a capacity of 50 MGD or greater.
- The Consultant's AutoCAD Lead Coordinator shall have been responsible for CAD coordination for three (3) W/WWTP 3D projects within the last 10 years with a minimum capacity of 25 MGD, and have demonstrated experience successfully using Plant3D, Civil3D and ProjectWise (or similar document control system) on past projects, and be familiar with integrating work products from other teams utilizing Revit and AutoCAD Electrical.
- The Consultant's Specifications Coordinator shall have been responsible for developing, compiling, and cross-referencing specification coordination using Construction Specifications Institute (CSI) MasterFormat 2004 edition (or later), having completed specifications for a minimum of three (3) multi-discipline projects within the last 10 years.
- The Consultant's Startup and Commissioning Coordinator shall have been responsible for startup and commissioning of three (3) W/WWTPs with a minimum capacity of 25 MGD within the last 10 years, with at least one (1) W/WWTP having a capacity of 50 MGD or greater.

Section 6. Owner Responsibility

DW will provide to the Consultant all available relevant information to aid in the design process. This includes but is not limited to:

- Previous studies.
- Project Objectives.
- Provide review comments within agreed upon schedules.
- Provide all surveys including design surveys and as-built elevations.
- Provide historical as-built records.
- Provide relevant and appropriate design, specifications, and drafting for DW-designed project components including but not limited to: Ralston Outlet Works and Conduit 16.

Section 7. Project Assumptions

The following assumptions were made in the development of this Scope of Services:

- The Preliminary Design Phase will proceed to 20%. The 20% level will be a major design gate for the project and will meet the requirements detailed in the Scope of Services. Initially, the Consultant's Scope of Services will only be defined through the 20% Preliminary Design Phase. The Scope of Services from 20% to Final Design and Bidding may be developed near the conclusion of the 20% design.

- The design phase, through 20%, will not exceed a period of 7 months from Notice to Proceed unless so authorized in advance of the delivery deadline by the DW.
- DW will provide payment for all agreed upon permit application and review fees.
- Public relations efforts up to 20% design will be completed by DW.
- The project execution shall follow the NSRWTP Project Management Plan, a copy of which will be provided to the selected Consultant, and applicable portions of DW's CPPM:
<http://www.denverwater.org/DoingBusinesswithUs/EngineeringOverview/CapitalProjectsProceduresManual/>.
- Drawings shall be provided in electronic media on the shared NSRWTP ProjectWise site and in quality hard copy media. AutoCAD Drawings shall be in accordance with DW's design drafting CAD Standards:
<http://www.denverwater.org/DoingBusinesswithUs/EngineeringOverview/CADStandards/> and shall include, but not be limited to, the Standards located online in DW's CPPM.
- Project specifications shall be submitted in CSI MasterFormat 2016 edition and adhere to DW's Engineering Specifications, with formatting consistent with the CPCS:
<http://www.denverwater.org/DoingBusinesswithUs/EngineeringOverview/CPCS/> and any revisions made by the NSRWTP Specifications Team.
- Construction Contract General Conditions, Contract Agreement, Bid Forms, etc., shall be provided by DW via the CPCS.
- A "gate" is a term used to reference a formal document and the process used to acknowledge project decisions. Gates are designed to acknowledge project decisions. Gates are designed to acknowledge approval of its related topic by project stakeholders. A gate also is a means to document decisions that have been made which are critical to the progress of the design beyond the current milestone/phase. Once a gate is "closed", no changes can be made to the design deliverable or data transferred without approval from DW. If changes are identified, those changes are to be logged on the project change log and addressed in accordance with the change management process identified in the NSRWTP Project Management Plan and the CPPM.
- The Consultant shall assume the site is free of any sensitive cultural resources that require environmental clearance or other required permitting at the local, state, or Federal level.
- The Consultant will submit the project to CDPHE for design approval, and will coordinate and cooperate with other DP consultants to obtain applicable information needed for the submittal.

Section 8. Project Schedule

DW may elect to follow the proposals with a formal questionnaire and/or interview to assist with the proposal evaluation. Final selection of a Consultant will be based upon the selection criteria detailed in Section 12.

The anticipated Project Schedule is summarized below:

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| • May 17, 2016 | Request for Proposals advertised through www.denverwater.org |
| • May 26, 2016 | Mandatory Pre-Proposal Meeting |
| • June 8, 2016 | Final Written Questions Due |
| • June 16, 2016 | Proposals Due |
| • July 11-13, 2016 | Consultant Interviews |
| • July 14, 2016 | Announce Consultant Selection |
| • August 10, 2016 | Selected Consultant Recommendation to the Board |
| • August 11, 2016 | Notice to Proceed Issued to Selected Consultant |
| • February 28, 2017 | Preliminary Design (20%) Completion |
| • March, 2019 | Final Design Completion (estimated) |
| • 2023 | Construction Complete (estimated) |

Any requests for clarification or additional information regarding submission of this RFP shall be submitted in writing via e-mail (peter.mccormick@denverwater.org), or during the Pre-Proposal meeting that will be held in the Denver Police Protective Association (PPA) Event Center at 2105 Decatur Street, Denver, Colorado 80211 on Thursday, May 26, 2016 at 8:30 am, local time. Limit attendance at the Pre-Proposal Meeting to three employees per firm. Written requests for interpretation, clarification, and/or additional information must be received no later than 5:00 pm, local time, Wednesday, June 8, 2016. DW is in the process of determining selection committee members for all NSRWTP RFPs, and has instituted a blackout period for the solicitation of design services. Any contact with DW or OR team members regarding the NSRWTP during the RFP period, except Peter McCormick, may result in consultant disqualification.

Section 9. Scope of Services

The following Phase breakdown describes Phases 1 through 6 and primary responsibilities of the Consultant for DP#2 of the NSRWTP Project. The scope of work for this proposal is limited to Phase 1 and 2; a future proposal may be requested for Phases 3 through 6.

Phase 1 Project Management and Administration: Project Management and Administration involves tasks to create the elements necessary for the Consultant to execute the Project and effectively collaborate within the Project team, in accordance with the NSRWTP Project Management Plan.

Phase 2 Preliminary Design: Preliminary Design includes conceptual planning and design development for the Project to a 20% level.

Phase 3 Final Design: Final Design includes design development for the Project through 30%/60%/90% design milestones and delivery of the Final for Construction documents. Final design includes bid phase services, preparation of addenda as necessary, and preparation of conformed documents.

Phase 4 Construction: Engineering services during construction include submittal review, Request for Information (RFI), change management, communication, observation and inspections.

Phase 5 Commissioning: During the course of the Project and through the completion of construction, Consultant will participate in project startup, testing, and commissioning planning and execution for successful transfer of the project to DW operations.

Phase 6 Project Closeout: The Consultant will transfer project files to DW, complete filing of project documents, prepare Record Drawings, final deliverables, warranty and project close-out.

Phase 1 – Project Management and Administration

Project Management and Administration includes the following activities:

- General Project Management.
- Project Work Plan development for incorporation in the NSRWTP Project Management Plan.
- Project invoicing and reporting.
- Project workshops.
- Project meetings.
- Project gate review meetings (20%).
- Project Management review meetings.

Task 1.1: General Project Management

Time for this task is allocated to the Consultant Project Manager to oversee and administer the project. For the purposes of estimating, the Consultant shall assume the OR will provide Project-level oversight and management, with the Consultant providing DP-specific oversight.

Deliverables:

The following deliverables will be provided as part of Task 1.1.

- *Cost Loaded Schedule/Work Breakdown Structure time allocation provided to OR for incorporation in master NSRWTP Cost-Loaded Schedule.*

Task 1.2: Project Work Plan

The Project Work Plan will document the key project information required by all Consultant Team members to assist them in executing the project to meet the required objectives on-time and on-budget, and meeting DW's critical success factors and quality requirements. The key elements of the project work plan are described below, and will be incorporated into the NSRWTP Project Management Plan for all Project Team members:

- Consultant Project Team members, their roles, and responsibilities. This will also include the staffing plan (management, engineering, quality control, etc.)
- Scope of Services with Work Breakdown Structure.
- Baseline Planned Value (PV) schedule to be used for Earned Value (EV) reporting.
- Consultant Project safety plan.
- Consultant Quality Assurance/Quality Control plan. DW and the OR will be responsible for cross-package coordination, quality assurance, and quality control. The Consultant is expected to provide its plan for internal DP quality assurance and control. In addition to producing the Project Work Plan, the Consultant will provide input to the following components of the master NSRWTP Project Management Plan components:

- Project budgets.
- Communications Plan.
- Risk management plan, including risk register.
- Project cost-loaded schedule in GANTT chart format. Schedule updates will be provided in monthly progress reports, if changes have been made and agreed upon by DW. Project Schedule input shall be provided in Primavera P6 for ease of incorporation into the master NSRWTP Project Schedule.

Deliverables:

The following deliverables will be provided as part of Task 1.2.

- *Consultant Project Work Plan and input to master Project Management Plan.*

Task 1.3: Project Invoicing and Reporting

Monthly invoices will be prepared and submitted to DW and OR in an approved format. Invoices shall include the following broken down by task, Prime Consultant, and Subconsultants:

- Total contract amount.
- Detailed charges for the current invoice period.
- Total charges to date.
- Previous billings.
- Outstanding balance.
- Current amount remaining.
- Total amount due.

Consultant shall be responsible for management of the Consultant and Subconsultant Project Team's overall cost, schedule, and quality, actively coordinating with DW and OR to manage:

- Project Costs.
- Project Schedule.
- Document Control.

Monthly project status reports shall be prepared and submitted to DW and OR, along with the monthly invoices. These reports will include:

- Summary of services completed since the previous report.
- Any cost or schedule variance from the approved Project Schedule and budget, including separate earned value graphs for the Consultant and each Subconsultant.
- Any updates to the master Project Issues and Potential Change logs. Any updates to the master Project Issues and Potential Change logs.
- Milestones and/or deliverables scheduled in the coming month.

This task also includes periodic project review by Consultant management to assure that the project is meeting DW's critical success factors, is on schedule, and within budget.

Deliverables:

The following deliverables will be provided as part of Task 1.3.

- *Monthly invoices.*
- *Monthly Project Status Reports.*
- *Monthly input/updates the Project Cost-Loaded Schedule.*
- *Earned value analysis and graph.*

Task 1.4: Project Workshops

Workshops are to inform and obtain input from Project Team stakeholders. DW/OR will prepare agendas and minutes for all workshops, which include:

- Kickoff workshop for DPs #1, 2, and 3 – assume four Consultant team members for two hours.
- Kickoff workshop for DPs #4, 5, and 6 – assume four Consultant team members for two hours.
- Stakeholder workshops for key decisions – assume four one-hour workshops with two Consultant team members.
- Lean Workshop for DGD development – assume attendance of four Consultant team members for a single five-day workshop, facilitated by others.
- Lean workshop for Site Layout finalization – assume attendance of four Consultant team members at a single five-day workshop, facilitated by others.

Deliverables:

The following deliverables will be provided as part of Task 1.4.

- *Input to master NSRWTP Decision Log & Action Item Log.*
- *Notes and action items from each workshop for inclusion in Minutes, prepared by DW/OR.*

Task 1.5: Project Meetings

Project meetings include the key Project Team members from each DP and, as needed for the current topic, project stakeholders. Assume up to three attendees at each meeting, as applicable to the meeting topic.

- Discuss ongoing issues and conflict resolution.
- Three Specifications Standards meetings.
- Three CAD Standards meetings.
- Three co-location planning meetings.
- Bi-weekly DW and DP Consultant Management review meetings.
- Bi-weekly DW, OR and DP Consultant Team meetings.
- Four half-day partnering sessions to discuss NSRWTP progress to date and provide coordination between DPs.

Deliverables:

The following deliverables shall be provided as part of Task 1.5.

- *Input to agendas, minutes, and decision logs prepared by DW/OR.*

Task 1.6: Project Management Review Meetings

Quarterly management review meetings shall be held with Consultant and DW's/OR's Project Management Team (upper echelon of Project Management for the project) in attendance. The meeting will be attended by up to two members of the Consultant Team. A total of three hours per attendee is assumed for the workshop, with an additional one hour of project management time for input to agenda and minutes development.

Deliverables:

The following deliverables shall be provided as part of Task 1.6.

- *Input to agendas, minutes, and decision logs prepared by DW/OR.*

Phase 2 – Preliminary Design Phase Services

Preliminary Design Phase Services includes the following activities:

- Advance the elements to the preliminary design 20% milestone.
- Develop planning documents, conceptual site layouts, and preliminary design drawings including drawing index identifying the Consultant's anticipated list of drawings. Drawing index shall identify and distinguish those drawings developed and prepared during preliminary design and those to be completed during final design.
- Prepare a list of proposed technical specifications in CSI MasterFormat 2016 edition.
- Complete the specific Tasks associated with Preliminary Design and coordinate and interface with the design team concurrently advancing their respective elements of the project.

Task 2.1: Design Criteria

Consultant shall review DW's preliminary design criteria documentation and update for all conventional unit treatment processes.

- Consultant shall evaluate alternatives and make recommendations to DW.
- Consultant shall fully develop design criteria for each unit process.
- Consultant shall fully develop design criteria for each ancillary process to be utilized by DP#4.
- Consultant shall develop design criteria for advanced water treatment processes that may be implemented in the future so that reasonable and appropriate accommodations can be made for these processes.
- Future unit treatment processes may include ozone and/or UV disinfection and GAC adsorption.
- Consultant shall develop process flow diagram with mass balance for all unit processes.
- Consultant shall develop structural design standard to be implemented by all design packages, including any tunnels between structures.

Deliverables:

The following deliverables shall be provided as part of Task 2.1.

- *Alternatives analysis evaluation memoranda.*
- *Design criteria for unit processes.*
- *Design criteria for ancillary processes.*
- *Process flow diagrams.*
- *Structural design standards, including tunnels.*

Task 2.2: Water Quality

Consultant shall review water quality data and water quality goals established by DW for the NSRWTP. Consultant shall finalize water quality goals to meet or exceed regulatory requirements, and recommend practical and achievable goals for non-regulated constituents and, if practical, targets established by DW. Consultant shall evaluate and make recommendations for NSRWTP treatment performance goals, such as particle counts and chlorine to ammonia ratios.

Deliverables:

The following deliverables shall be provided as part of Task 2.2.

- *Water quality memorandum.*

Task 2.3: Site Layout

Consultant shall review DW conceptual layout and prepare a refined preliminary layout, which conveys the following minimum requirements:

- Best use of the site, meeting known constraints while minimizing footprint and conserving space for future facilities.
- Provides modularity and expandability for all unit processes for initial flow of 150 MGD and future expansion to 250 MGD. Modular design shall accommodate future expansion and shall allow the NSRWTP to operate reliably at flows as low as 10 MGD without excessive solids deposition or maldistribution.
- Provides redundancy for all treatment processes and accommodates ease of operation, monitoring, maintenance and repair. Makes accommodations for sumps or drains from each unit process and conveys flows to DP4 for recycle or further treatment as may be required to facilitate operations and maintenance activities. Makes accommodations for refilling of each unit process with finish water conveyed from DP4 prior to bringing a unit process back online.
- Makes reasonable and appropriate accommodations for advanced water treatment processes.
- Segregates and conveys off-specification water that may be produced during startup activities of unit processes or treatment trains. Consultant shall evaluate and make recommendations for recycle, reuse, equalization storage and/or discharge alternatives of off-specification water.

- Evaluate the alternatives for sustainability design components and Energy Star products in support of potential Leadership in Energy and Environmental Design (LEED) and/or Envision™ certifications, including structure location and orientation, energy usage, materials of construction selection, environmental impacts, and water efficiency. Identify cost/schedule impacts and feasibility of all alternatives identified.
- Consultant will be responsible for collaborating with all other consultants, coordinating and compiling memoranda and making overall recommendations for Envision™ certifications.
- Consultant shall evaluate and make recommendations to reduce the energy demands of the NSRWTP and evaluate secondary or backup power sources and requirements, including uninterruptable power supply, as may be appropriate. Consultant shall evaluate and make recommendation on how multiple power sources shall be coordinated, and shall collaborate with the DP#3 consultant.
- Consultant shall perform a net-zero evaluation including cost estimates for systems, permits, installation and maintenance and payback schedule, as appropriate, for hydropower generation, wind power, photovoltaic solar power, passive solar power and other best available alternative or renewable energy technologies. Alternative energy systems may be located at the NSRWTP facility or may be remote facilities.
- Consultant shall develop site plan showing proposed and future structures including but not limited to; headworks, flocculation/sedimentation, filtration, disinfection contact basins, control room and laboratory.
- Consultant shall be responsible for design calculations and specifications for all process piping within structures and all yard piping between structures. Consultant shall provide sufficient details, including specifications and design calculations, to DP#1 consultant who will be responsible for the layout of yard piping.
- Consultant shall initiate development of overall AutoCAD Plant3D model, incorporating 3D models from other DP consultants and maintaining the overall 3D for presentation to DW throughout Phase 2 and subsequent Phases of work.
- Consultant shall utilize overall model to identify and resolve conflicts as appropriate.
- Consultant shall evaluate and make recommendations for operation and maintenance personnel access between unit processes. Consultant shall evaluate tunnel access for personnel, vehicular, and combined use as piping galleries, power distribution and communication.
- Incorporates site features and improvements developed by other DP consultants.

Deliverables:

The following deliverables shall be provided as part of Task 2.3.

- *Site layout drawings using AutoCAD Civil3D site model developed by DP#1 consultant, showing existing, proposed and future structures, roads, and other major features developed using AutoCAD Plant3D.*
- *Design calculations and details related to process yard piping.*
- *List of technical specifications.*
- *Sustainability certification evaluation memorandum including layout drawings as may be appropriate for alternative or renewable energy sources, cost-benefit analysis and schedule impacts.*
- *Net-Zero evaluation memorandum including calculations and supporting data.*

Task 2.4: Hydraulic Model

Consultant shall develop and maintain a hydraulic gradeline (HGL) model through the NSRWTP.

- Consultant shall develop and maintain the HGL model from the NSRWTP headworks through the NSRWTP clearwells. Provide HGL model to DP#1 consultant for incorporation in the overall NSR Program HGL model.
- Consultant may be required to incorporate hydropower generation at one or more locations within the system into the HGL model.

Deliverables:

The following deliverables shall be provided as part of Task 2.4.

- *Hydraulic Profile drawings and model at 10, 75, 150 and 250 MGD.*
- *Validated hydraulic analysis computer files.*
- *Preliminary hydraulic memorandum.*

Task 2.5: Process and Instrumentation Diagrams (P&IDs)

Consultant shall develop preliminary P&IDs for proposed and future treatment processes from headworks to NSRWTP clearwells.

- Consultant shall prepare smart P&ID's for the main unit process flow developed to 75% completion level, as well as ancillary process streams developed to 50% completion level, working in collaboration with DP#3 and DP#4 consultants.
- P&ID shall identify treatment chemicals and addition points. Consultant shall develop criteria for the design of the ancillary processes for chemical addition, storage and metering. Design criteria shall be collaboratively shared with the NSRWTP Project team and specifically with the DP#4 consultant, who will be responsible for designing these support facilities. Consultant shall incorporate into the design reasonable and appropriate accommodation for use of alternate chemical, such as ferric chloride, should the need arise.
- P&ID developed by Consultant shall identify all residuals, filter backwash water supply and backwash waste reclamation, and settled solids from the clarification process. Consultant shall prepare design criteria for all ancillary process flows and shall collaboratively share with the NSRWTP Project team and specifically with the DP#4 consultant who will be responsible for designing these support facilities.

Deliverables:

The following deliverables shall be provided as part of Task 2.5.

- *P&ID's for all major unit processes and ancillary unit processes, developed using AutoCAD Plant3D.*

Task 2.6: Basis of Design Memorandum

Consultant shall prepare one or more Basis of Design Memorandum(s) for the unit processes, which document alternatives analysis and technical decisions, and makes recommendations for streamlined design. The Basis of Design Memorandum(s) shall address codes, standards, safety, design constraints, alternatives, process criteria, loading criteria, redundancy, modularity, materials of construction, and assumptions. Consultant shall evaluate and make recommendations for Computational Fluid Dynamics (CFD) modeling to be performed in Final Design, as may be appropriate to evaluate velocity gradients. Consultant shall evaluate and make recommendations for commissioning, isolation, dewatering, maintenance/service, refilling, and restarting all unit treatment processes. Consultant shall evaluate and make recommendations for discharge or recycle of off-specification flows and drain water that may be produced during startup or maintenance activities, including evaluation of permitting and or regulatory compliance. Additionally, the Basis of Design Memorandum(s) shall, at a minimum, document and memorialize the following design considerations:

- **Headworks:** Consultant shall evaluate and make recommendations for one or more sleeve valve(s) to break head from Ralston Reservoir outlet works raw water conduit by DP#1 into the NSRWTP. Valve(s) shall be selected to accommodate future advance water treatment alternatives. Consultant shall identify chemical injection of oxidants, coagulants polymers, and pH adjustment for pre-treatment chemical supply to be designed by DP#4. Consultant shall evaluate and make recommendations for rapid mix mechanical coagulation equipment, stage requirements, detention time, and delay of certain chemicals as may be appropriate. Consultant shall evaluate and accommodate building superstructure including personnel access as well as equipment removal and maintenance.
- **Flocculation:** Consultant shall evaluate velocity and flow distribution for process control and isolation of trains for maintenance, perform hydraulic evaluation, evaluate mechanical flocculation equipment, and identify sumps, channels, gulleys and walkways for maintenance. Consultant shall evaluate and accommodate building superstructure including personnel access as well as equipment removal and maintenance.
- **Clarification:** Consultant shall evaluate flow distribution for process control and isolation of trains for maintenance, perform hydraulic evaluation, evaluate mechanical sludge collection equipment, evaluate sludge transfer pumping to DP#4 thickener, identify sumps, channels, gulleys and walkways for maintenance, evaluate and make reasonable and appropriate recommendations for settled water chemical injection (filter aid) location and dispersion and future ozonation. Consultant shall evaluate and accommodate building superstructure including personnel access as well as equipment removal and maintenance.
- **Filtration:** Consultant shall evaluate flow distribution for process control and isolation of trains and filter maintenance, perform hydraulic evaluation for filter operation at 10 gpm/ft² and 12 gpm/ft², evaluate filter media (GAC, anthracite, depth, effective size, etc.), underdrain, evaluate filter backwash supply and backwash waste discharge, filter air scour system, filter to waste system piping and hydraulics, recycle flows, identify sumps, channels, gulleys and walkways for maintenance, evaluate chemical injection location and dispersion. Consultant shall evaluate and accommodate building superstructure including personnel access as well as equipment removal and maintenance.

- Disinfection Contact Basin (DCB): Consultant shall evaluate and make reasonable and appropriate accommodations for future UV treatment. Consultant shall evaluate Concentration-Time (CT) of basins and baffling options, piping, valves and channels for flow distribution and isolation of trains for maintenance. Consultant shall evaluate pre- and post-DCB chemical injection. Consultant shall evaluate and accommodate building superstructure including personnel access as well as equipment removal and maintenance.

Deliverables:

The following deliverables shall be provided as part of Task 2.6.

- *Basis of Design Memorandum for each unit process.*

Task 2.7: Design Guidance Document (DGD)

Consultant shall prepare a Project specific DGD.

- Consultant shall review DW's CPCS for applicable standards to incorporate into the DGD. Consultant shall assist in preparation for and participate in a Lean event hosted by DW to finalize the Main Treatment Process DGD, and prepare documents identified during the Lean event. Any gaps identified will be evaluated by Consultant with recommendations for possible inclusion in the NSRWTP CPCS during Phases 3 and 4.
- Consultant shall provide analysis and alternatives evaluation of site sustainability design components in support of potential Leadership in Energy and Environmental Design (LEED) and/or Envision™ certifications. Identify cost/schedule impacts, potential alternatives for use of recycled or locally-sourced materials and green infrastructure, net-zero energy analysis tools and study of North System.
- Consultant shall prepare a safety guidance document for prevention through design.

Deliverables:

The following deliverables shall be provided as part of Task 2.7.

- *Main Process Equipment and Structures DGD.*
- *List of proposed main process equipment and structures design considerations in support of project sustainability certification, including cost-benefit analysis and schedule impacts.*
- *List of proposed supplemental technical specifications.*
- *List of proposed supplemental standard details.*

Phases 3-6

Scope of work, deliverables and schedule for Phase 3 and subsequent phases will be negotiated with Consultant and DW based on performance of Phase 1 and 2, and an increased project design definition developed during Phase 2.

Section 10. Proposal Requirements

The proposal shall outline the Consultant's scope of services, which at a minimum must include the criteria set forth within this Request for Proposal, and the Consultant's approach to administer and complete the project. A detailed project approach will assist DW in understanding the Consultant's comprehension of the project and the opportunities and constraints that a project of this complexity may contain.

Proposals shall be limited to 20 pages (double-sided counted as 2 pages) not including resumes. At a minimum, the Proposal shall include:

- Cover Letter (two pages maximum).
- Qualification documents as outlined in Section 5 (four pages maximum).
- Written statement regarding the consultant's eligibility to perform the work without a conflict of interest (one page maximum).
- Project approach including any unique solutions and clearly identifying all assumptions including any additional scope proposed as add-on tasks.
 - Provide detailed lessons learned from past programs. Include lessons learned on workflow with multi-firm programs.
 - Provide lessons learned regarding use of DW's intended CAD/3D modeling platforms. Should the Consultant recommend a different CAD approach, provide detailed explanation of cost savings and/or other benefits to DW.
- Detailed schedule with any deviations from the schedule included herein clearly identified and tied to the project approach (an 11-inch by 17-inch format for the schedule is acceptable).
- Provide an organization chart showing the team structure and their duties (an 11-inch by 17-inch format for the organization chart is acceptable).
- Tailored 2-page resumes for key project personnel, including projects similar in nature and complexity to the NSRWTP Project. In addition to the Consultant's key project personnel, NSRWTP project specific roles are detailed below.
 - **Startup and Commissioning Coordinator** – Responsible for coordination of startup and commissioning planning, working in collaboration with other DP consultants. Startup and Commissioning planning efforts will be led by DP#3.
 - **Specifications Coordinator** – Responsible for the development and coordination of project specifications, the Specifications Coordinator will be a member of the NSRWTP Project Specifications Team, which will be comprised of staff from each DP and led by DW/OR.
 - **AutoCAD Lead Coordinator** – Responsible for the versioning and control of AutoCAD files and security/permission access to common AutoCAD reference files. The NSRWTP Project DP Consultants will employ AutoCAD Civil3D, Plant3D, Electrical, Revit, and Revit MEP (Mechanical, Electrical, and Plumbing), along with ProjectWise for document management. The DP#2 Consultant shall be responsible for developing and maintaining the overall Plant 3D Model, coordinating with other DP consultants to import 3D model components from each design package.

The Consultant understands that DW's selection process incorporates an evaluation of key personnel, and that DW's decision to select the DP#2 Consultant is based upon the representation of the Consultant's intent to use the key personnel for the duration of the Project. Therefore, the Consultant will agree to retain the listed **Project Manager** and **Lead Process Engineer** through Project design completion. Any replacement for key individuals must be approved in advance and agreed to in writing by DW. A change in **Project Manager** or **Lead**

Process Engineer without pre-approval in writing may result in DW terminating the Consultant's contract for convenience, require the Consultant to pay DW a one-time amount of \$100,000.00 (Project Manager) or \$50,000.00 (Lead Process Engineer), to be withheld from progress payment, and/or allow DW to select the key personnel's replacement. This provision shall not apply if a medical or personal emergency requires a key personnel's individual release from the Project, or if the key personnel leaves the employment of the Consultant or its affiliates.

Price Proposals shall be submitted in a separate, sealed envelope marked "Confidential". At a minimum, the Price Proposal shall include:

- Manpower labor estimate (Work Breakdown Structure) by labor type/hours for the following major project phases, tasks, provided under *Scope of Services*. Include the corresponding hourly rates (an 11-inch by 17-inch format for the work breakdown structure is acceptable).
 - Phase 1: Project Management and Administration
 - Task 1.1: General Project Management
 - Task 1.2: Project Work Plan
 - Task 1.3: Project Invoicing and Reporting
 - Task 1.4: Project Workshops
 - Task 1.5: Project Meetings
 - Task 1.6: Project Management Review Meetings
 - Phase 2: Preliminary Design Phase Services
 - Task 2.1: Design Criteria
 - Task 2.2: Water Quality
 - Task 2.3: Site Layout
 - Task 2.4: Hydraulic Model
 - Task 2.5: Process and Instrumentation Diagrams
 - Task 2.6: Basis of Design Memorandum
 - Task 2.7: Design Guidance Document
- Clear identification of proposed Minority and Women Business Enterprise (MWBE) participation and proposed MWBE firms and scope of work. A MWBE goal of 2 to 5% has been set for this DP. Clearly identify any proposed Small Business Enterprise (SBE) participation and proposed SBE firms and scope of work. DW encourages engagement of SBEs, although no specific SBE goal has been set for the Project. More information on DW's MWBE Program can be found online at: <http://www.denverwater.org/DoingBusinesswithUs/SmallDisadvantagedBusinessEnterprisesSDBE>
- Proposed additional scope items as add-on tasks with detailed description of tasks, benefits and WBS for the add-on(s).
- Proposed labor rate escalation for calendar years 2017 through 2019.

Section 11. Addenda to the Request for Proposals

If it becomes necessary to revise any part of the RFP, an addendum will be placed online at: <http://www.denverwater.org/DoingBusinesswithUs/RequestsforProposals/BidProposalsEngineering/> prior to **June 10, 2016**. Respondents are responsible to check online prior to submission of their proposal and acknowledge receipt of addendum(s) within their proposal.

Section 12. Selection Criteria

DW will review the Proposals and make a selection based on best value while considering the following criteria.

Criteria	Standard	Weighting Factor
Project Personnel and Firm Experience	<ul style="list-style-type: none"> Do the assigned personnel have the demonstrated skills and experience to provide a detailed and complete design? Do personnel have firsthand experience performing this type of work in a collaborative, multi-disciplined, multi-firm team? Is the firm's capacity and commitment to providing the staff identified in the Project Organization Chart clearly demonstrated? Are key project staff identified and is their experience working on W/WWTP projects of similar size and complexity to the NSRWTP highlighted? Are proposed team members clearly tied to project references? Do key team members have Project Management Professional certification? Do the firm and the firm's proposed team members meet or exceed the minimum qualifications listed in Section 5? Does the firm's proposal demonstrate adequate resources and support services within the Denver metro region for key staff roles throughout all phases of the Project? Does the team composition reflect commitment to meeting or exceeding the MWBE participation goals for the NSRWTP Project? 	4
Proposed Approach, Project Plan and Schedule	<ul style="list-style-type: none"> Does the proposal show an understanding of DW's project objectives and the results that are desired from the project? Does the approach reflect the team's desire to serve as an active and engaged member of a multi-firm design team? Does the firm's proposed approach add value, innovation and efficiencies to the Project? Is the firm capable of completing the work in the required time frame and avoiding schedule impacts to other DP consultants? Does the proposed schedule demonstrate a complete understanding of DW's objectives and scope of work, as well as key hand-off points between DP consultants? 	4
Cost and Work Hours	<ul style="list-style-type: none"> Do the work hours presented accurately reflect the required level of effort, at the proper level of experience, to complete the project tasks? How do unit labor rates and escalation compare to other firms? What percentage of the proposed team is local and how do travel costs for out-of-town staff compare to other consultants'? Are key staff dedicated to the project at the level of commitment noted in the proposal? Is the WBS completed properly, detailed, and meet the project needs? Are subconsultant fees and expenses clearly identified? 	2

The scale of the criteria is from 1 to 10, with 1 being a poor rating, 5 being an average rating, and 10 being an outstanding rating. All criteria will be multiplied by the associated weight to give a weighted criteria score. The weighted criteria scores will be summed for a cumulative score. The maximum possible cumulative score is 100.

Section 13. Proposal Submittal

Selection of a Consultant will be based on the selection criteria described above. The Proposal shall address all the selection criteria.

Costs associated with Proposal preparation, pre-proposal meeting attendance, interview attendance and so forth shall be borne entirely by the proposing Consultant. Proposal information becomes property of DW.

Firms are recommended to access and become familiar with a copy of the most recent version of DW's CPCS and CPPM CAD standards and specifications formatting at no cost to DW. Consultants will be responsible for meeting the requirements of DW's standards.

Eight hard copies and one electronic copy (pdf on a CD or flash drive) of the Consultant's Proposal and Price Proposal shall be submitted to Peter McCormick, Design Project Manager, by 11:00 a.m., local time, on Thursday, June 16, 2016 at Denver Water, 1600 West 12th Avenue, Denver, Colorado 80204. Proposers acknowledge that DW may be required to disclose some or all of the documents submitted with a Response, pursuant to the Colorado Open Records Act, C.R.S. 24 72-200.1, et seq. Under C.R.S. 24-72-204(3) (a) (IV), DW may deny inspection of any confidential commercial or financial information furnished to DW by an outside party. Therefore, a Proposer shall clearly designate any documents submitted with its Response that it deems proprietary or confidential, to aid DW in determining what must be disclosed in the event of a request for documents under the Colorado Open Records Act.

Section 14. Attachments

The following documents have been posted to DW's website for reference:

- Draft Professional Services Agreement
- Sample Work Breakdown Structure